

Appln. No. 09/449,215

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Claim 23 is currently amended.

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

In Section 2 of the Office Action, which is the Examiner's response to amendment and arguments, the Examiner states:

Applicants argue (page 10) that their claimed invention (claims 1, 14, and 23) differs from the prior art because "there is no teaching, suggestion, or motivation in either of Wood or Alvarez to apply three-dimensional image rendering on a PACS workstation and then communicate the three-dimensional image rendering file back to the PACS server for storage thereon." As noted in the previous office action, Wood teaches a medical image management system in which two-dimensional medical images are stored on an image server, and are communicated to an image workstation, and 3D rendering is performed on the image workstation and is provided to the server.

The Examiner admits that Wood fails to specify that the image server is a PACS server and the image workstation is a PACS workstation. However, PACS systems (servers and workstations) were exceedingly well known in the art, and commonly used to enable medical facilities to streamline patient information and cut the enormous costs associated with film development and courier fees. PACS systems were comprised of image servers and image workstations that included the functions of archiving and communicating medical images. As noted in the previous office action, Alvarez teaches a PACS server and PACS workstation that

Appln. No. 09/449,215

is used to view/transmit ultrasonic images for 3D rendering (col. 6, lines 22-29).

Applicants further argue (page 11) that "although Alvarez describes a system of PACS workstations and servers, Alvarez does not teach that 3D images could be rendered on a PACS workstation and communicated over a communication network to a PACS server." The Examiner disagrees. Alvarez explains that the 3-D volume data can be viewed by using available volume rendering algorithms (col. 1, lines 19-24), wherein the volume rendering algorithms are saved as bookmarks, and sent along with the volume data to the PACS workstation for 3D rendering (col. 5, lines 49-57). For example, Alvarez explains that his system can send either 2-D images, bookmarks, and volumes, depending on the PAC's capabilities. Therefore, if Alvarez's system sends a PACS workstation the 2-D images, bookmarks, and volumes, it can be understood that the PACS workstations is capable of performing the 3D rendering (utilizing the bookmark information); since it would have been inefficient and useless to send the volume rendering information (bookmark) to the workstation if the workstation was not able to perform the 3D rendering.

In response to applicant's argument (page 12) that there is no suggestion of "desirability" to combine the references (page 12), the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation (desirability) to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d '596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Wood and Alvarez are both concerned with the management (viewing, archiving, communicating) of ultrasound images, and provide a system that includes image servers and workstations for constructing three-dimensional renderings for diagnostic purposes. Wood's server is connected to access ultrasonic images and reports, and makes them accessible to a personal computer, terminal or workstation at a remote location (Wood, col. 3, lines 20-24). Alvarez's PACS system increases flexibility by allowing older systems to access the images on the image server (Alvarez, col. 6, lines 22-29). The ordinary artisan would have been desired to combine the teachings

Appln. No. 09/449,215

of Wood and Alvarez in order to provide a system that can interact with a plurality of medical imaging workstations, thereby increasing the efficiency and flexibility of the diagnosis process. Therefore, it would have been obvious to combine the teachings of Wood and Alvarez so that the two dimensional images are stored on a PACS server, and are communicated to a PACS workstation, and 3D rendering is performed on the PACS workstation.

With regard to the Examiner's response, Applicants disagree. The response to the amendment and arguments made by the Examiner reflects the current rejection.

As previously stated, independent claims 1, 14, and 23, recite, in some form, that the PACS server communicates 2-dimensional image information to a PACS workstation. At the PACS workstation, the 2-dimensional image slices are compiled, via software provided on the PACS workstation into a 3-dimensional image rendering.

As recited in claims 1 and 14, the 3-dimensional image rendering process is carried out by at least one of multi-plane reconstruction (MPR), multi-plane volume reconstruction (MPVR), and maximum intensity pixel (MIP) projection. The 3-dimensional image renderings are compiled from the 2-dimensional image slices. Once the 3-dimensional image renderings are derived at the PACS workstation, the 3-dimensional image rendering is communicated back to the PACS server for storage as a 3-dimensional image rendering file thereon. Also, as recited in claims 1 and 14, the 2-dimensional image information files are initially stored in one of a DICOM 3 or DEFF format on the PACS server.

The Examiner has admitted that Wood fails to specify that the image server is a PACS server and the image workstation is a PACS workstation. To this admission, the applicant's agree. Further, applicants assert that just because PACS systems including servers and workstations were known in the art at the time of the invention, PACS workstations were not used for 3-dimensional image rendering. The Examiner states that Alvarez teaches a PACS server and PACS workstation that is used to view/transmit ultrasonic images for 3D rendering. To this assertion, applicant's disagree. Alvarez teaches that a dedicated ultrasound system 10 is

Appln. No. 09/449,215

used to save 2D image slices and to create 3D ultrasound volume data and to store 3D ultrasound volume data and viewing parameters. The rendering of 2-dimensional slices into 3D image renderings by such dedicated machines is exactly the problem which was solved by applicant's invention. Applicants utilize PACS workstations for creating 3-D image renderings, whereas previously such image renderings were done on dedicated machinery such as the ultrasound machine itself, as indicated in Alvarez, or as applicants have indicated on dedicated stand alone workstations thereby freeing up the dedicated machine for other tasks, such as, in Alvarez, performing ultrasound exams.

Accordingly, Alvarez does not disclose the use of PACS workstations for creating 3-D image renderings. Further, nowhere does Alvarez discuss the use of a PACS server, Alvarez does discuss the use of PACS systems however these PACS systems disclosed are not used for generating the 3-D image renderings. The PACS systems disclosed are PACS workstations that interact with ultrasound imaging system 10. However, no where does Alvarez disclose, teach, or suggest that the PACS workstation can be used to render the 3-D image from a collection of 2-D image slices and then communicate the 3-D image rendering to a PACS server. On the contrary, Alvarez teaches generating the 3-D image rendering on the ultrasound imaging system 10 and then communicating the 3-D file and/or parameters to a PACS workstation. Accordingly, Wood, in combination with Alvarez, does not disclose, teach or suggest, the combination of elements recited in independent claims 1, 14, and 23. In fact, Alvarez teaches only the system with its inherent problems that applicants invention was created to solve. Thus, independent claims 1, 14 and 23 and their respective dependent claims are therefore allowable.

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

Appln. No. 09/449,215

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 06-1447. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 06-1447. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 06-1447.

Respectfully submitted,

Date September 03, 2003By Alistair K. Chan

FOLEY & LARDNER
777 East Wisconsin Avenue, Suite 3800
Milwaukee, Wisconsin 53202-5306
Telephone: (414) 297-5730
Facsimile: (414) 297-4900

Alistair K. Chan
Attorney for Applicant
Registration No. 44,603

RECEIVED
CENTRAL FAX CENTER
SEP 03 2003

OFFICIAL

-11-

001.1483148.1

Atty Dkt. No. 070191-0237 (15-IS-5290)